

**METHOD OF CREATING HIGH-QUALITY RELAXED SiGe-ON-INSULATOR
FOR STRAINED Si CMOS APPLICATIONS**

ABSTRACT OF THE DISCLOSURE

- 5 A method of forming a thin, high-quality relaxed SiGe-on-insulator substrate material is provided which first includes forming a SiGe or pure Ge layer on a surface of a first single crystal Si layer which is present atop a barrier layer that is resistant to the diffusion of Ge. Optionally forming a Si cap layer over the SiGe or pure Ge layer, and thereafter heating the various layers at a temperature which permits interdiffusion of Ge
- 10 throughout the first single crystal Si layer, the optional Si cap and the SiGe or pure Ge layer thereby forming a substantially relaxed, single crystal SiGe layer atop the barrier layer. Additional SiGe regrowth and/or formation of a strained epi-Si layer may follow the above steps. SiGe-on-insulator substrate materials as well as structures including at least the SiGe-on-insulator substrate materials are also disclosed herein.